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THE MONIST.

MENTAL EVOLUTION.

AN OLD SPECULATION IN A NEW LIGHT.

THE theory of organic evolution, now generally accepted, needs to be supplemented by a theory of mental evolution. On a superficial examination of the matter the necessity for such a supplementary theory does not perhaps strike one as obvious, the mental seeming naturally to arise out of the organic and to be part of one continuous development. But closer investigation and a more rigid and exact treatment bring to light certain important and peculiar features, and disclose the necessity of some such hypothesis as it is my purpose to set forth briefly in the following pages.

By organic evolution I mean the natural development, whether by "selection" alone or by this in co-operation with other natural processes, of the organisms which live upon the surface of this earth; and by mental evolution I mean the natural development of the mental faculties in at least the higher animals among these organisms. Now with regard to organic evolution there is no common and general agreement in respect of the first origin of primitive life on the earth. Some evolutionists believe that the living was somewhen, somehow, and somewhere evolved from the not-living. Others do not feel justified in holding this view, and deem it wiser to restrict their speculations as to natural genesis within the limits of the organic. So too at the other end of the developmental curve;

there is no common and general agreement as to the evolution of the mental faculties or spiritual being of man. Some evolutionists believe that both in body and in mind, man is the product of natural development; others do not feel justified in holding this view, and retain unshaken the conviction that man in his spiritual essence is no part nor product of the common elements of nature. Seeing then that on either side there is want of agreement, on the one hand as to the origin of life, on the other as to the origin of man, I shall deal for the most part with that large area concerning which there is a more unanimous consensus of opinion, and in the main confine my speculations within the field of mental evolution in animals, ranging, say, from the amœba to the dog.

Few will be found to deny or even to question the fact that our dumb companions and four-footed friends have mental faculties which enable them accurately to adjust their actions to the varied circumstances in the midst of which their lives are passed. Even if we see cause to hesitate, as I myself hesitate, before we ascribe to them self-consciousness and reason, in the narrower sense in which this word is used; still we must acknowledge that their instincts are powerful, their intelligence wonderfully keen and active; and that they are capable of strong emotional feeling both of affection and of antipathy. Should we so welcome them as our companions and friends if we regarded them as unconscious, insentient automata? But when we turn to the other end of the scale of life, to the amœba and all the myriad minutiæ that swarm in ponds and stagnant pools, we are wont to speak with less confidence. Their consciousness, if so we can call it, is of so simple an order, their sentience of so low a grade, that we can hardly with any accuracy use the phrase "mental faculties" with reference to organisms so lowly. We feel uncertain whether in their case unconscious automatism does not after all pretty accurately express the facts. At any rate it would trouble us little or not at all if some one proved their automatism to-morrow. And yet, on the theory of evolution, out of such lowly beginnings have sprung the sagacity and affectionate devotion of the dog. But if the amœba and his tribe are insentient automata, at what stage of the development did consciousness creep in? And whence came it? Or put what is fundamentally the same question in another way. In the common course of generation the dog is developed from a minute egg-cell, one hundredth of an inch or less in diameter, with which a yet more minute sperm has entered into fertile union. Supplied with shelter, warmth, and nutriment by that maternal self-sacrifice which is a deeply significant fact of organic progress, this little speck of living stuff passes, by a process strictly continuous, though profoundly modified by the catastrophe of birth, into the dog with its wealth of intelligence and affection. It is surely impossible without extravagance to speak of the fertilised ovum as conscious. Where then in the continuous process of development does consciousness come in? How, and whence? We are not nowadays to be put off with the ambiguous assertion that consciousness and intelligence are "potentially" present in the germ. We ask: What is *actually* present therein as the basis of this potentiality? Or are we told that consciousness dawns at or shortly after the catastrophe of birth? Then again we ask: Whence comes this dawning consciousness, and by what means does it become associated with the puppy's brain? In yet another form does a question of like general implication suggest itself. Granted that in the ovum there is present something which we may call the germ of consciousness somehow associated with the protoplasmic material of which that ovum is constituted. How comes it that, in the adult dog, consciousness is associated with the brain? Why is the association of consciousness concentrated, so to speak, in this one tissue of the many which arise during the differentiation of development? That the association is so concentrated or specialised is now generally admitted to be the fact. We speak indeed of the skin, the palate, the nose, the eye, the ear, as each in its kind sensitive. But none the less we believe that the seat of consciousness is the brain or some part of it. Only when the nerves running inwards from skin, palate, nose, eye, or ear, have conveyed their appropriate stimuli to the brain, does that organ tingle with the accompaniment of consciousness. There and there only does consciousness "emerge"; not in peripheral sense-organ or ingoing nerve. But why? How comes it that there is this peculiar association of consciousness with the functioning of a particular organ?

Perhaps we are told that consciousness is the special product of brain-tissue. But let us note that the word "product" is here used in an unwonted sense. We are not likely, it is to be hoped, to fall into the crude and demonstrably false materialism expressed in the formula, "as the liver secretes bile, so does the brain secrete consciousness." Consciousness being immaterial, the second and fourth terms are incommensurable, and the formula is sheer nonsense. Nor are we likely (though here there is greater danger) to fall into the more subtle error of regarding consciousness as a mode of energy. "Granted," says Professor Tyndall, "that a definite thought and a definite molecular action of the brain occur simultaneously; we do not possess the intellectual organ, nor apparently any rudiment of the organ, which would enable us to pass by a process of reasoning from the one to the other: the chasm between the two classes of phenomena would still remain intellectually impassable." Consciousness is something *sui generis*. It is neither matter nor energy. It may accompany the transformations of energy in the dog's brain; but to the category of these transformations of energy it does not, and, for any clear thinker, can not belong. And if we are told that the word "product" is used in the sense implied by Professor Huxley when he speaks of phenomena of consciousness being "called into existence" by physical processes; then we must again ask whence they are called into existence. We do not now speak of matter or energy being called into existence from a shadowy nowhere. When a cloud is called into existence on a mountain peak we know that the material particles have only assumed a new form. When the electrical current is called into existence or generated as we phrase it, we know that we are dealing with one of the many transformations of energy. And when phenomena of consciousness are said to be called into existence, we have a right to ask: Do you mean, by this phrase, creation *ex nihilo?* Or do you mean, origin by transformation? And if the latter, transformation of what?

Having thus opened up these several questions, all of like implication, let us now endeavor to set forth the answer which seems most philosophical and most closely in accordance with scientific analogies. And to this end let us consider the living dog. His frame is pulsating with life and restless activity, and somehow associated with the transformations of energy in that brain of his there is consciousness—or what in the dog is the analogue of that consciousness with which alone I can claim any acquaintance at first hand, my own. Were his skin and the walls of his skull as transparent as glass; did the molecular vibrations of his brain lie open to the keenest scrutiny of the physical investigator; could we trace in detail all the varied and orderly transformations of energy of which that brain is the theatre; the accompanying consciousness would still be beyond our reach. *We* might follow the changes of energy; he alone would feel the states of consciousness. But suppose that the dog dies. His body lies before us stiff with the *rigor mortis*. If we had weighed it previous to death, and if we were to weigh it again after death, the scales would give us no information of the departure of anything material. All signs of consciousness, however, are gone. And could we see through skin and skull into the brain, which during life was the theatre of so complex and orderly a sequence of transformations of energy, we should find that it was still and motionless. It is true that we cannot actually do this. But we know that, whereas, during life, the functional action of the brain gives rise to certain material products, at death the production of these substances ceases. We are therefore justified in saying that, omitting minor qualifications, the orderly transformations of energy in the brain and the concomitant consciousness cease together at death. Closely associated during life, varying together in health and sickness, ceasing together at death, what is the nature of their connection?

On the hypothesis of scientific monism it is believed that they are different aspects of the same phenomena: that what objectively to the physical investigator are transformations of energy in the brain, are subjectively to the dog states of consciousness? Let us look into this hypothesis. Let us see whither it will lead us; and if it will in any way help us over some of our difficulties. But first let us pay a moment's attention to the impatient exclamation which some may feel inclined to interpose, that this assumption of the ultimate identity of brain-energy and consciousness, the two being respectively the objective and subjective aspects of the same occurrences, does not in the least do away with the mystery of the matter. That the same two occurrences should have different aspects, objective and subjective, is, it will be said, just as mysterious as that two separate existences energy and consciousness should be associated together. Of course it is. I should be shallow and pretentious indeed if my object were by any *hocus pocus* to attempt to hide the so-called mystery. *All* ultimate facts are mysterious. The fall of a stone to the ground is to-day as mysterious as it was in the days before Newton; the phenomena of life, as mysterious as in the days before Darwin. Our advances in science and in thought may do away with minor mysteries, but they leave the great ultimate facts of nature as mysterious as before. The end of our explanations is always to bring us face to face with the inexplicable. Not, therefore, in any hope of doing away with an ultimate mystery do I suggest that we look into and follow out some implications of this so called identity hypothesis.

Let us regard the matter from the objective aspect first, from the side to which the occurrences present themselves as transformations of energy. The state of consciousness being *ex hypothesi* accompanied or "called into existence" by certain complex and orderly molecular vibrations in the brain or some part thereof, we have to note that from the physical point of view these molecular vibrations constitute an exceeding complex and orderly mode of energy. It is upon this energy that we must fix our attention; the material structure of the brain being what we may call the vehicle of its manifestation. I am anxious that the reader should carefully follow me here. We are too apt to regard the *structure* as the essential thing on which to concentrate our mental gaze, partly no doubt because, through the invaluable labors of microscopists, we know so much that is definite about this structure. But a more penetrating insight enables us to see that the structure is merely the necessary basis of what is the really important thing—the manifestation of energy. The material structure of a steam-engine is of importance. But why? Because it is the vehicle for the performance of work. That is the really essential part of the business. In like manner nerve-structure is of importance. But why? Because it is the vehicle for what Professor Huxley happily termed the neurosis, the complex and orderly manifestation of energy. The essential importance of looking at the *going* machine, at the performance of work, at the energy of the matter in motion, not merely the material structure that is moved—the essential importance, I say, of fixing our attention on this, being fairly grasped, we may now proceed to enquire from what the complex and orderly vibrations of the dog's brain have been evolved. In the fertilised ovum from which the dog was developed, (and the same is true of the amœboid ancestor from which, hypothetically, the race of dogs has been evolved,) there is certainly nothing approaching the orderly complexity of these molecular vibrations. But there are simpler organic modes of motion from which these complex molecular vibrations have arisen by a continuous process of development. It is from these simpler modes of energy in the simpler organic substance of the ovum that the more complex modes of energy which characterise the workings of the dog's brain have been evolved. In the development of the ovum into the embryo, and thence into the puppy and the dog, we may trace step by step all the stages of the evolution of those material structures which are the vehicles of these special manifestations of organic energy. We may watch the further and further differentiation of the nervous tissue, and the fashioning of the brain and its parts. It is true that we cannot indicate the exact moment when, in the increasing complexity of the tissues, the simpler forms of organic energy pass into the higher form of brain energy accompanied by consciousness. But that is just because it is a continuous development, an evolution. That the passage from the one into the other does actually take place we are bound, by all the canons of logical reasoning, to admit. It is only during life, however, that neurosis occurs or is possible. A great number of modes of organic energy proceed side by side in the pulsating tissues of the living dog, their orderly continuance being what we term *life*. And only in and through their orderly continuance is the maintenance of the structure of the tissues rendered possible. The organic structure is like a spinning top. Only so long as it spins and manifests its proper energy is its stability maintained. All around it are forces which tend to make it totter to its fall. But so long as it spins freely it can resist all minor attempts to upset its stability. And when the dog dies; what happens then ? The molecular vibrations of the brain in common with all other forms of organic energy cease. The top no longer spins; and the structure totters to its fall. Decomposition sets in. The orderly organic changes which characterise life, give place to the destructive changes which characterise decay. But according to the law of the conservation of energy, although there is decomposition of the tissues of which the body was composed there is no destruction or annihilation of energy. The particular modes of energy through which the body was instinct with life pass away; but only to give rise to their equivalents in other modes of energy. Just as the puddle in the road disappears, but only to give origin to an equivalent mass of invisible water-vapor; just as the candle disappears, but only to give rise to its equivalent mass in the products of combustion; so throughout life and in death the energy which throbs in the tissues neither appears nor disappears except at the expense of, or to the gain of, other modes of energy. Life is like a vortex in a rapid stream; on surrounding energy it is dependent for its continued existence; into surrounding energy it melts away. And this is true not only of individual life but of life in its entirety. Some believe that the vortex had a natural origin, the organic being evolved from the inorganic. Others hold that it was through the direct interposition of the finger of God that the tiny vortex of primitive life was set a twirling. Be this as it may, once initiated the vortex of life is dependent on surrounding stores of energy.

Turning now from the objective aspect to the subjective aspect we pass from neural processes to states of consciousness. In the language of the identity hypothesis, here provisionally adopted, the states of consciousness in the dog's mind, are the subjective aspect of what, from the objective aspect, are the molecular vibrations of his brain-tissues. And as in considering the matter objectively, so now in regarding the mental aspect, we must ask from what the complex and orderly states of consciousness of the dog's mind have been evolved. In the fertilised ovum from which the dog is developed, (and the same is true of the amœboid ancestor from which, hypothetically, the race of dogs has been evolved,) nothing so complex as a state of consciousness is to be found. From what then have the states of consciousness been evolved? Do we not seem forced by parity of reasoning to answer: From something more simple than consciousness but of the same order of existence, which answers subjectively to the simpler organic energy of the fertilised ovum? Such, at any rate, is the hypothesis which appears to me the most philosophical and the most logically consistent. It requires, however, no little effort of thought to conceive the existence of those elementary states from which consciousness may have had its origin. We may be aided in doing so, perhaps, if we fix our attention on the close association of brain-energy and states of consciousness, regarding them as *distinguishable* but not *separable*. Now the nervous energy of the brain is extraordinarily complex; and yet we believe that it arises by a process of continuous development from the much less complex energy of the fertilised ovum. In the ovum there is no brain-energy; there is only the far simpler germinal energy from which it is evolved. So too, the consciousness in the dog's mind is wonderfully complex; but if it has arisen by a process of development, it must have been evolved from something of like nature only indefinitely simpler. May we not fairly suppose, therefore, that in the fertilised ovum, though there is no consciousness, there are the germinal states from which consciousness may be evolved? Or to put the matter tersely, may we not say: As the complex molecular vibrations of the brain are to the simpler molecular vibrations of the ovum; so are the complex states of consciousness associated with the former to the simpler states of infra-consciousness, if we may so call them, associated with the latter? It is the association of consciousness and infra-consciousness with energy—its objective manifestation—that is the distinguishing feature of the view which I am endeavoring to set forth. Concomitant with the evolution of higher modes of organic energy from those lowly modes which alone obtain in the ovum or the amœba, is the evolution of consciousness from lowly modes of infra-consciousness.

It is true that it is only through the exercise of the conceptual faculty of reason, never through the senses or by direct perception, that we can reach this suggested infra-consciousness. But this will hardly be regarded as a valid objection by those who believe in the existence of the ether, or by those who adopt the atomic theory, neither of which could be reached by the senses or by perception alone. Still less will it be regarded as an objection by those who have grasped the distinction between energy as manifested in the objective world, and consciousness as inevitably subjective. Of no consciousness other than our own have we direct and first-hand experience. And yet certain manifestations of energy as exhibited by other living beings force upon us the conviction that we are not alone in possessing the subjective attribute of consciousness. That not only the dog and the elephant, but the bee also and the spider are endowed with this attribute and are conscious, though not self-conscious, few of us doubt for a moment. But their consciousness is presumably far simpler than ours. Carrying this simplification yet farther down the scale of animal life, we reach in the jelly-fish, the sea-anemone, and the sponge, forms of life which can hardly be said to be conscious at all with a consciousness comparable to our own. Yet they would seem to be endowed with the dim foreshadowings of such consciousness. Finally in the amœba and the monad we have these dim foreshadowings reduced to the lowest terms that are suggested by the study of organic life. If, then, in the series of organic forms, down even to the lowest, we admit consciousness or its foreshadowing, though it lies and must ever lie beyond the reach of our senses, why should we hesitate to generalise our belief in logical and scientific form, and hold that all organic modes of energy are associated with conscious or infra-conscious states?* It may perhaps, be objected that such a view, carried to its logical conclusion involves the supposition that all the tissues of the body are conscious or at least infra-conscious, whereas it is a well-established scientific conclusion that consciousness is specially associated with the nervous tissue of the brain. I see no reason, however, why this conclusion should not be accepted. If the organic transformations of energy in the ovum are associated with what for lack of a better term I have here called infra-consciousness, then there are two possibilities. Either the accompanying consciousness is *entirely* concentrated in association with the molecular vibrations of the brain; or it merely becomes *dominant* in the functioning of that tissue and continues in the dim infra-conscious condition in the other tissues of the body. Now to judge from our own experience it is only the dominant molecular vibrations in the brain that are accompanied by the clear light of consciousness. The sub-dominant neural changes are indeed accompanied by a dim sub-consciousness. But there are many molecular changes (even in the cerebral hemispheres themselves where consciousness is "called into existence") which do not rise to the level of consciousness at all or are quite lost in the glare of that consciousness. Why this should be so I am not prepared to say. It seems to be a law of our mental being. Certainly it is convenient that it is so; and it may have been fostered or established by natural selection. We all know the sense of confusion that arises when, in certain states of intense nervous excitement, a host of ideas are crowding up into dominance and jostling each other for supremacy. An organism so constituted that such a state of things was normal, would, we may suppose, stand but a poor chance of survival. Hence perhaps there has arisen that due subordination of conscious, sub-conscious, and infra-conscious states which characterises the normal life of conscious beings. Having regard, then, to the cerebral hemispheres where consciousness emerges, not all the molecular changes there transpiring rise to the level of full consciousness. There is not a little of what Dr. Carpenter used to call unconscious cerebration. We seem forced to admit the existence of submerged states of consciousness; states which are infra-conscious, but which may become conscious at any moment by rising into dominance. And if in the cerebral hemispheres there are infra-conscious states, why should there not be associated with every molecular thrill of the living body yet lower states of infra-consciousness too deeply submerged ever in man to become dominant?

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* I have elsewhere (*Animal Life and Intelligence*, p. 467) suggested the term *kinesis* for the manifestation of energy, and the term *metakinesis* for its conscious or infra-conscious aspect.

It is, however, one thing to show that there is no insuperable objection to accepting the existence of such infra-conscious states, if such existence be otherwise probable, and another thing to establish this probability. And this leads us back again to the grounds on which their existence may fairly be regarded as probable. We are told that the mental faculties of the dog in common with his physical or organic frame, have arisen in the course of ages by a process of development. It is clear that such a statement is intended to apply to the living dog with active faculties; to a *going* mechanism, or rather organism which is also conscious. Well and good. The material structure has been evolved from lower forms of matter: the organic modes of energy (in virtue of which he lives), from lower forms of energy; the mental states (in virtue of which he is conscious), from—what? I suggest in continuation and conclusion of this sentence—from lower forms of infra-consciousness; that is to say, of what is of the same order of existence as consciousness, but has not yet risen to the level of consciousness. Many people will no doubt see no necessity for such a conclusion. It is making an unnecessary bother, they will say, about a very simple matter. At some undefined stage of organic evolution—perhaps when nervous tissue had its genesis, perhaps earlier—consciousness began to dawn and has since developed in clearness and brightness during the evolution of higher and higher organisms. According to this view, the ascending curve of evolution is divisible at some undefined point into two portions: of which one represents organic evolution previous to the dawn of consciousness; the other organic evolution subsequent to the dawn of consciousness. But the question at once suggests itself: From what did consciousness dawn at this undefined point? In answer to which there are some who do not hesitate to reply that the consciousness arose out of the physical conditions; that when the rhythmic dance of organic molecules reached a certain intensity and intricacy consciousness was developed. There is, indeed, a certain class of nerve-physiologists, or of medical men who write on nerve-physiology, who, if they do not hold that states of consciousness are generated from the energy which accompanies the working of the brain-tissues, at any rate write as if this was their belief. But such a view is quite untenable. If there is one thing clearly established, both by those who have approached the matter from the scientific side, and by those who have approached the matter from the metaphysical side, it is that the distinction between energy and consciousness is radical and absolute. No conceivable increase in the orderly complexity of the molecular vibrations of brain-tissue could give rise to that consciousness which differs *toto cœlo* from any manifestation of energy.

And yet though stated in a form that is philosophically false, and therefore misleading, the conclusions of these earnest students of nerve-physiology are practically sound. Grant, for the moment, that the states of consciousness in the dog's mind are the subjective aspect of the molecular energy of his brain. Then the following diagram (Fig. 1.) will represent the ascending curve of development which, from the objective aspect, is a development of modes of energy, and from the subjective aspect is a development of modes of consciousness.

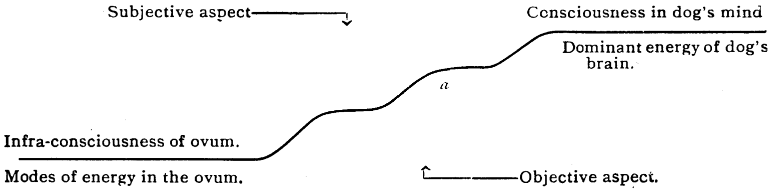
Subjective aspect
Consciousness in dog's mind
Dominant energy of dog's brain.
a
Infra-consciousness of ovum.
Modes of energy in the ovum.
Objective aspect.

Fig. 1.

Now what the nerve-physiologists are sometimes apt to do is, at some moment of development say *a*, to change their point of view, from the subjective aspect which deals with consciousness to the objective aspect which deals with energy. Their conclusions are practically sound because they are still dealing with the same developmental curve. They state these conclusions in language which is philosophically misleading because they suddenly jump from the subjective aspect to the objective aspect and ignore the great distinction between the two. When they say that consciousness emerges from the physical conditions at *a*, they presumably mean that at this point we are first justified in speaking of consciousness or the subjective aspect in anything like a human sense. But is it not more logical to hold that, just as from the objective standpoint the complex energy of the dog's brain has been developed from the simpler energy of the ovum, so from the subjective standpoint, the complex consciousness of the dog's mind has been developed from the simpler infra-consciousness of the ovum? And if we do not accept this view, do we not seem committed to the unevolutionary doctrine that the conscious aspect suddenly makes its appearance, without those lowly germinal beginnings which it is of the essence of any theory of development to postulate?

It will perhaps be said that all this assumes an identity hypothesis, with its supposed double aspect, which is not accepted by the majority of men of science. Let us look at the matter, therefore, from what would seem the only other point of view open to one who accepts the theory of development as applicable alike to the dog's mind and to the dog's body. If states of consciousness and the molecular transactions in the brain are not different aspects of the same occurrences, they are parallel, concomitant, or associated phenomena. Our diagram will thus become that given below.

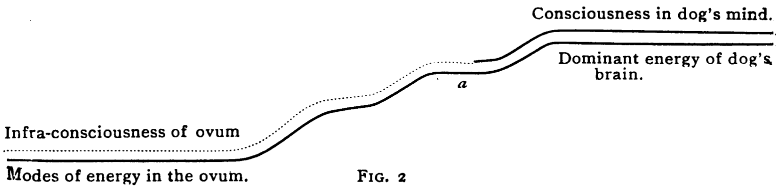
Consciousness in dog's mind.
Dominant energy of dog's brain.
a
Infra-consciousness of ovum
Modes of energy in the ovum.

FIG. 2

Here the parallel or associated phenomena occur together at the higher end of the developmental curve, and, at *a*, the consciousness is supposed to emerge. On this view there is less justification for the nerve-physiologists' assertion that it arises out of physical processes; for it is not simply another aspect of these processes, but something wholly different arbitrarily associated with them. Even on this view it would seem more logical to suppose that since the association of mental states with the dominant neural energy is of normal occurrence from *a* onwards, the consciousness there emerging has been evolved from infra-consciousness parallel and concomitant with the physical processes in the ovum. If this be not so, we may once more ask : From what has the parallel line to the right of the diagram been evolved? We cannot say from the neural conditions without changing our point of view and ignoring the great distinction between matter and energy on the one hand and consciousness on the other. From what then has the consciousness been evolved, if not from something of like nature only indefinitely simpler which has here been spoken of as infra consciousness?

We must now take a further step, one however in which all evolutionists will not be prepared to follow us. Attention has already been drawn to the fact that those who accept the theory of evolution are not agreed in their faith—for it is on either side a matter rather of belief than of demonstration—with respect to the origin of life. Some believe that the primitive organic germs were not produced by natural development nor through any process of evolution. For such, the hypothesis I am advocating must be submitted in the following form—when first the life-energy was started by the direct interposition of the finger of God it was endowed with some dim form of infra-consciousness which in the course of evolution developed into consciousness. And presumably those who see in the amœba and the fertilised ovum some dim foreshadowings of consciousness may follow me thus far. But for those who believe that the organic has arisen on this earth by process of natural development from the inorganic, the hypothesis must be more sweeping in its range. We must say that all modes of energy of whatever kind whether organic or inorganic have their conscious or infra-conscious aspect.* Startling as this may sound there is, I believe, no other logical conclusion possible for the evolutionist *pur sang*. For where are we to draw the line ? The states of consciousness of the higher animals have been evolved from lower forms of infra-consciousness in the amœba-like or yet more simple protoplasmic germs in the dawn of life. But if those low forms of organic infra-consciousness were themselves evolved, from what could they arise if they were not developed from yet more lowly forms of infra-consciousness similar in kind but inferior in degree associated with inorganic transformations of energy? In any case it is here submitted that this doctrine that infra-consciousness is associated with *all* forms of energy is necessarily implied in the phrase mental evolution for all thinkers who have grasped the distinction between consciousness and energy. And if this be admitted there is disclosed, by implication, an answer behind and beyond that ordinarily given to a question which has again and again been asked—the question:—Is there a conservation of consciousness analogous to the conservation of energy? The negative answer generally given to this question results from the fact that the question itself has always been put in a form which does not admit of a satisfactory solution. There is not a conservation of consciousness any more than there is a conservation of neural energy or a conservation of electricity. There is no conservation of neural energy because this is only one mode of energy which may be transformed into other modes. Not until we have generalised energy so as to include *all* its modes can we speak of conservation in reference to it. So too not until we have generalised that universal form of existence, of which consciousness is only the highest and most developed mode, so as to include all modes, can we speak of conservation in reference to it. But so generalised I submit that there is a conservation of that form of existence which includes both consciousness and infra-consciousness, co-ordinate and coextensive with the conservation of energy.* Just as the dominant neural transformations in the dog's brain are like a special vortex in the onward-flowing stream of the world's energy, so are the states of consciousness in his mind like a special vortex in the onward flowing stream of that mode of existence which, whether it have risen to the level of consciousness or not, is still of the conscious order. For the believer in scientific monism there is but one vortex, objectively presented as energy, subjectively felt in consciousness. For the dualist there are two vortices, (1) an objective vortex and (2) a subjective vortex associated with the other and "called into existence" by it. In either case the vortex is dependent for its continual existence on surrounding stores of that out of which it has arisen; and in either case the modern tendencies of scientific thought suggest conservation which is but the antithesis of creation *ex nihilo.**

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*In the phraseology I have elsewhere suggested, there is no kinesis unaccompanied by its metakinetic aspect.

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* That is to say, a conservation of metakinesis co-ordinate and coextensive with the kinetic conservation of energy.

In conclusion it should be noted that this hypothesis is but a new presentation of an old speculation. It differs as it here stands from any theory of "mind-stuff" in that it regards the question rather from the dynamical than from the statical point of view. Not "mind-stuff" answering to matter but a universal conscious order or aspect of existence answering to universal energy is the leading idea I have sought to develop. In its newer form, again, this hypothesis differs from the view that "all force is will-power," or the view that "all matter is conscious," or the theory of "intelligent monads," in endeavoring, not to carry anything like *our* consciousness down into association with the simpler manifestations of energy, but rather to seek in association with these lower manifestations the germinal states indefinitely simpler than consciousness, from which nevertheless consciousness has been developed. Finally the keynote of this newer presentation is that which is the keynote of all modern theories of life and of thought—the doctrine of evolution.

C. Lloyd Morgan.

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*The bearing of this conservation of consciousness and infra-consciousness (metakinesis) on Eastern conceptions of immortality and on transmigration would be an interesting theme to follow out but is beyond the scope of the present paper.